

We claim:

1. An air purification system for removing airborne particles from an airflow, the system comprising:

a hood having an inlet for receiving the airflow from a space beneath the hood and a hood outlet for exhausting the airflow to a duct;

a first filter mounted within the hood and disposed in the airflow to remove therefrom at least some of the airborne particles to produce a first-filtered airflow; and

a second filter mounted within the hood and disposed downstream of the first filter to receive the first-filtered airflow, the second filter having a porous filtration chamber containing at least one filtration member and the first-filtered airflow flows through the filtration chamber and the filtration member removes airborne particles from the first-filtered airflow to produce second-filtered airflow that is exhausted through the hood outlet, wherein the airflow path between the first and second filters defines a substantially straight path.

2. The air purification system as recited in claim 1, wherein no additional filters are disposed between the first filter and the hood inlet.

3. The air purification system as recited in claim 1, wherein the second filtration chamber contains a plurality of filtration members.

4. The air purification system as recited in claim 3, wherein the filtration members are formed from silica.

5. The air purification system as recited in claim 4, wherein the filtration members are formed from silica gel.

6. The air purification system as recited in claim 4, wherein the silica is porous.

7. The air purification system as recited in claim 1, wherein the filtration member is formed from a ceramic.

8. The air purification system as recited in claim 7, wherein the second filter further comprising a plurality of ceramic filtration members.

9. The air purification system as recited in claim 8, wherein the ceramic is porous.

10. The air purification system as recited in claim 1, wherein the second filter is slidable with respect to the hood.
11. The air purification system as recited in claim 1, wherein the first-filtered airflow travels from the first filter to the second filter without passing through any additional filters.
12. The air purification system as recited in claim 1, wherein air travels from the hood inlet to the hood outlet without passing through any other filters.
13. The air purification system as recited in claim 1, wherein the first filter is a centrifugal air filter presenting baffle plates.
14. The air purification system as recited in claim 1, wherein the second filter is movable to a position whereby the filtration members are removed from the airflow.
15. The air purification system as recited in claim 14, wherein the second filter is removable from the hood.
16. The air purification system as recited in claim 14, wherein the filtration members are regenerative.
17. An air purification system for removing airborne particles from an airflow, the system comprising:
 - a hood having an inlet for receiving the airflow and a hood outlet for exhausting the airflow;
 - a first filter supported by the hood and positioned such that the airflow from the inlet passes through the first filter and at least a portion of the airborne particles therein are removed therefrom to produce a once-filtered airflow;
 - a second filter separately connected to the hood at a location downstream of the first filter to receive the once-filtered airflow, the second filter having a filtration chamber that contains a plurality of silica filtration members that remove some airborne particles from the once-filtered airflow to produce second-filtered airflow that is exhausted through the hood outlet.
18. The air purification system as recited in claim 17, wherein the first-filtered airflow travels in a straight path from the first filter to the second filter.

19. The air purification system as recited in claim 17, wherein the first-filtered airflow travels from the first filter to the second filter without passing through any additional filters.
20. The air purification system as recited in claim 17, wherein the filtration chamber is disposed in a plane that is oriented substantially normal with respect to the first-filtered airflow.
21. The air purification system as recited in claim 20, wherein the first filter extends along a plane substantially parallel to the plane of the filtration chamber of the second filter.
22. The air purification system as recited in claim 21, wherein the first filter is spaced apart from the second filter.
23. The air purification system as recited in claim 17, wherein air travels from the hood inlet to the hood outlet without passing through any other filters.
24. The air purification system as recited in claim 17, wherein the second filter is removable from the hood.
25. The air purification system as recited in claim 24, wherein the second filter is slidable with respect to the hood.
26. The air purification system as recited in claim 17, wherein the filtration members are regenerative.
27. The air purification system as recited in claim 17, wherein the first filter is a centrifugal air filter presenting a plurality of baffle plates.
28. An air filter system for removing airborne particles from air, the combination comprising:
 - a hood having a top wall and a vertical wall that join to define a hood chamber having an inlet in its bottom for receiving a flow of intake air containing airborne particles and an outlet in its top wall for exhausting the flow of air;
 - a two-stage filter assembly mounted to the hood and disposed in the hood chamber to define an enclosed space that communicates with the hood outlet, the two-stage filter assembly including:

a first filter for receiving the flow of intake air and being operable to remove airborne particles therefrom to produce once-filtered airflow;

a second filter for receiving the once-filtered airflow and producing twice-filtered air that flows through the enclosed space to the hood outlet, the second filter having a porous filtration chamber containing a plurality of filtration members that remove airborne particles from the once-filtered airflow.

29. The air filter system as recited in claim 28, wherein the filtration members are formed from silica.

30. The air filter system as recited in claim 29, wherein the filtration members are formed from silica gel.

31. The air filter system as recited in claim 29, wherein the silica is porous.

32. The air filter system as recited in claim 28, wherein the filtration members are formed from a ceramic.

33. The air filter system as recited in claim 31, wherein the ceramic is porous.

34. The air filter system as recited in claim 28, wherein the air flows along a generally straight flow path between the first and second filters.

35. The air filter system as recited in claim 28, wherein the filtration chamber defines a front face that extends substantially perpendicular with respect to the flow path.

36. The air filter system as recited in claim 28, wherein the airflow travels from the first filter to the second filter without passing through any additional filters.

37. The air filter system as recited in claim 28, wherein the twice-filtered air passes directly through the enclosed space to the hood outlet without passing through any further filters.

38. The air filter system as recited in claim 28, wherein the first filter is a centrifugal filter.

39. The air filter system as recited in claim 38, wherein the centrifugal filter presents baffle plates extending into the intake air.

40. The air filter system as recited in claim 28, wherein the filtration members are porous and are selected from a material that can be regenerated.

41. A ventilation system for removing air from a food cooking area, the combination comprising:

a hood disposed above said food cooking area, the hood having walls which define a hood chamber for receiving intake air containing airborne particles from the food cooking area below;

a duct connected to an exhaust outlet on the hood for exhausting air from the hood chamber; and

a two-stage filter assembly mounted to the hood and disposed in the hood chamber to filter airborne particles from intake air flowing from the food cooking area to the exhaust outlet, the filter assembly including:

a first filter for receiving the intake air and being operable to remove airborne particles therefrom to produce once-filtered airflow; and

a second filter for receiving the once-filtered airflow and producing a twice-filtered air that flows directly to the exhaust outlet, the second filter having a filtration chamber containing a regenerative filtration material selected from the group consisting of silica, ceramic, diatomaceous earth, and zeolite.

42. The ventilation system as recited in claim 41, wherein the filter assembly extends between walls of the hood to define an enclosed space that communicates with the exhaust outlet.

43. The ventilation system as recited in claim 41, wherein the airflow path through the first and second filters defines a substantially straight path.

44. The ventilation system as recited in claim 41, wherein the second filtration chamber contains a plurality of filtration members formed from the filtration material.

45. The ventilation system as recited in claim 41, wherein the filtration material comprises a silica gel.

46. The ventilation system as recited in claim 41, wherein the silica is porous.

47. The ventilation system as recited in claim 41, wherein the second filter is slidably mounted in the hood.
48. The ventilation system as recited in claim 41, wherein the first filter comprises a centrifugal filter.
49. The ventilation system as recited in claim 48, wherein the centrifugal filter presents baffle plates extending into the intake air.
50. The ventilation system as recited in claim 41, wherein no additional filters are disposed in the hood.
51. The ventilation system as recited in claim 50, wherein the filtration chamber is defined by a porous front wall extending in a direction substantially perpendicular with respect to the straight path.
52. The ventilation system as recited in claim 51, wherein the first filter extends in a direction substantially parallel to the front wall of the second filter.
53. The ventilation system as recited in claim 52, wherein the first filter is spaced apart from the front wall of the second filter.
54. A method of removing grease from an airflow through a hood of the type disposed over a food cooking area in a kitchen, the steps comprising:
- (A) drawing incoming air into the hood from the cooking area;
 - (B) removing grease from the incoming air at a first filter mounted in the hood to produce once filtered air;
 - (C) receiving the once filtered air at a second filter removably mounted in the hood at a location downstream from the first filter;
 - (D) absorbing additional grease from the once filtered air into the a porous filtration member as the once filtered air flows through the second filter to produce twice filtered air; and
 - (E) outputting the twice filtered air into ductwork.
55. The method as recited in claim 54, further comprising:

(F) removing the second filter from the hood and regenerating the second filter by removing the grease absorbed in the porous filtration member.

56. The method as recited in claim 55, wherein step (F) further comprises:

- i) soaking the second filter in a detergent; and
- ii) washing the second filter in a dishwasher after performing step i.